

COGNITIVE BIASES

This chapter opened with the question “Why is trading so hard?” It seems that it should be easier than it actually is: we acknowledge that markets are extremely random and that there is a very small component of actionable trading signals in market data, but it is there. Why is it not possible to devise simple ways to capture this edge and watch profits accumulate in the trading account? This actually does describe the best high-level trading, but few individual traders ever get to that stage. One of the reasons is that the evolutionary adaptations and heuristics we just discussed result in some consistent cognitive biases. We are practically designed to make trading mistakes. Though these skills do serve useful purposes, unchecked they work just as effectively to ensure our failure as traders. Most traders enter the marketplace with no awareness of the handicaps and weaknesses they bring into the arena, and they are doomed to failure before they even begin. The first step in combating these biases is knowing that they exist and that they will unavoidably color every interaction with the market. A partial list of some of the more common cognitive biases follows.

Gambler's Fallacy

The gambler's fallacy stems from faulty intuition about random processes. After observing deviations in a random process, most people will be inclined to think that future deviations in the *opposite* direction are more likely. For instance, someone betting that a coin would flip heads might be inclined to increase the bet size after a few consecutive tails, or a trader might increase risk on trades after a string of losers. In both cases, they would feel that a win was somehow overdue. At the risk of oversimplifying, most of the problem comes from the fact that runs or streaks are much more common in random data than most people would expect; this single fact is responsible for many of the faulty intuitions we have about randomness.

It is also worth considering that there are cases in which the gambler's fallacy must be modified in market situations. The market is not always a flip of a fair coin. Markets exist in different regimes (e.g., trends or trading ranges, high- or low-volatility conditions, etc.) and certain kinds of trades will have strings of wins or losses in those conditions. It is important to understand the math and the theory, but it is equally important to understand where reality might deviate from those theoretical principles.

Biases Concerning Losses

Consider the following two scenarios. In each, you have a choice between taking the certain payout or loss and playing the game of chance:

1. You are given the choice between a certain \$100 win and a 20 percent chance of making \$1,000 with an 80 percent chance of winning nothing.
2. You are given the choice between a certain \$100 loss and a 20 percent chance of losing (having to pay) \$1,000 with an 80 percent chance of losing nothing.

In these cases, it is easy to evaluate the expected values, which tell us which are the correct choices to make probabilistically. In the first game, the winning game, the chance scenario has an expected value of \$200 ($0.2 \times \$1,000$), which is twice the certain payout. There is no doubt that the correct course of action is to play the game of chance, rather than taking the certain \$100. The same math applies for the losing scenario: a certain loss of \$100 compared to an expected value of a \$200 loss for the game of chance.

Logically, the correct course of action is clear: play the game of chance in the winning scenario instead of taking the certain gain, and take the certain loss in the second scenario. Most people, and even most traders, are inclined to do exactly the opposite in both cases. They will want to lock in the certain gain and will prefer to take their chances on the loss because there is *some* chance that they can avoid the loss altogether. This results in suboptimal decisions with respect to position management and exiting both winners and losers. Many traders will take small wins and will hold on to a loss in the hope that it will come back and they can somehow at least break even. There is good justification for the old adage to “cut your losers and let your winners run,” but many traders find this difficult to do in practice.

Another related problem, especially for newer traders, is that many traders find it difficult to calibrate their perception of risk inherent in a stop. Nearly all traders would prefer a small stop on a trade to a wide stop, with the idea that it is better to take a small loss than a big one. If you are properly and consistently sizing positions, there really is no such thing as a low-risk trade; every trade will have a consistent impact on the bottom line regardless of the distance to the stop point, but there certainly are *low-probability* trades. A tight stop may have such a high probability of being hit that it is, for all intents and purposes, a nearly certain loss. Over a large sample size, this is actually a very high-risk stop, even though it might be a loss of only a few pennies at a time.

Overconfidence Bias

Psychological research shows, time and again, that people tend to have an inflated view of their abilities and skills. Most people believe they are better, smarter, and more skilled than average. (Of course, it is impossible for *most* people to be better than the average!) This problem is exacerbated because trading tends to attract competitive, confident people to begin with. Thinking that we are better than we are is a recipe for disaster and is probably one of the reasons why so few traders make it past the learning curve.

There are traders whose hubris extends to every aspect of trading, but the market usually eliminates those traders quickly and efficiently. It is far more common to find traders who believe they have a special skill or affinity for an asset class. Do you just *know* what a certain set of stocks is going to do? Do you have a *special sense* for the relationship between a currency and a commodity? Do you have a *touch* for a certain trade setup? Well, one of the great things about trading is that it is easy to evaluate performance: are you making money? If you have a special skill, the only way it matters is if you are making consistent money over a large sample of trades. There are no excuses. In many cases, traders are much more confident about their trading abilities, about their analytical abilities, and about the epistemological limits of market knowledge than can

possibly be justified by their results. We are never as good as we think we are, and markets are far more random and far less knowable than we wished they were.

Confirmation Bias

Confirmation bias is the tendency to overweight information that reinforces our beliefs and to ignore or downplay information that contradicts. This bias is a key part of keeping many other biases alive. For instance, traders could not be overconfident in their ability with a certain trade setup if they were truly, objectively evaluating their results. However, when they remember two winners and forget about five losers, or come up with reasons why the five losers shouldn't matter, they are engaging in confirmation bias. Record keeping, both of trade results and of research, is critical, because this bias often distorts memory—you simply will not remember contradictory information, or it will be somehow fuzzy and obscured. In most cases, the confirmation bias is not a deliberate attempt to deceive or to manipulate data, but it occurs as a result of the fundamental ways in which we process information.

Anchoring Bias

Anchoring bias is the tendency to place undue weight on one particular piece of information and to ignore everything else. In the case of the overconfident trader, maybe she has made a trade 20 times with 18 losers, but one of the winners was dramatic. It is easy to find your entire perspective colored by a large outlier event, whether it was good or bad. Careful, objective analysis of trade results and pattern studies will guard against this bias. Paradoxically, though it is important for traders to spend time studying the market and its patterns, studying carefully chosen trade examples can actually be counterproductive; too many traders waste time trying to figure out how to reproduce the 1-in-10,000 trade. Do not spend undue time analyzing your big winners or losers; rather, spend time studying the entire set, and understand how those large outcomes fit within the framework of all possible trades.

Recency Bias

Recency bias is the tendency to overweight recent information, or information near the end of a series. Good public speakers know this and structure their speeches around this effect—always end with whatever you want the audience to remember. Good teachers know this when they review key information at the end of a lesson. Traders do not always realize how much they may be swayed by the most recent results of their trading system. There is a potentially nasty interplay between this bias and the tendency of the market to spend time in certain regimes or phases. Imagine a trader trading a good system that just happens to have a large loss due to a market distortion such as a large gap opening. On the next trade, the trader is probably going to be focusing on this loss rather than on the long history of the system. Once again, careful record keeping and broad studies of patterns are important; learn to see each event, regardless of where it falls in the time

line, as only one of many possible outcomes, and avoid attaching too much significance to large events, good or bad, near the end of the series.

Hindsight Bias

“Coulda, woulda, shoulda”—these are the poster children for this bias. When you are evaluating a trade and think you should have seen something or you could have avoided a loss if you had realized a piece of information was significant, be careful. It is far easier to say this after the fact than it is to act on this kind of information in the middle of the trade. This is another reason to avoid putting too much emphasis on the outcome of any one trade. If you spend too much time reviewing large winners or losers, there is a temptation to try to see what you could have done differently as the trade developed.

Illusion of Control

Research has shown that, particularly in stressful and competitive environments, people are unable to distinguish between outcomes due to skill or chance. Langer (1975), who first coined the term *illusion of control*, showed that it was more prevalent in tasks when “skill cues” were present—competitive tasks with clearly defined and familiar outcomes where the individual seems to have the ability to make a choice. In an experimental setting, if you have someone sit and watch a box with randomly flashing numbers and tell them they win when the numbers increase, they are not likely to think their skill has any effect on their results. However, give them a button to push, even if the button does nothing, and their assessment of their skill and its relevance to the task goes through the roof. Casinos know this when they design games of chance; why else would thousands of people push a button or pull a lever attached to a random outcome, and one with a negative expectancy, for hours at a time? For traders, this can be fatal. Many of the other biases are wrapped into one powerful package here—overconfidence, attribution, hindsight, confirmation—and these all reinforce the illusion that traders are really better than they are, and suppress the role that randomness plays in the bottom line.

For traders brave enough to try it, Mauboussin (2010) proposes an interesting solution: can you lose deliberately? At first, you will think the answer is obviously yes, but think deeper. Are you really confident that you could, for an extended period of time, trade *against* your methodology trying to lose, and show results that would be significantly different than what you have achieved trying to win? If you cannot lose deliberately, then whatever wins or losses you are experiencing are merely the result of chance. In short, you are wasting your time. It is better to know you do not know—to know you do not have an edge—than to waste your time and money on a futile exercise.

THE RANDOM REINFORCEMENT PROBLEM

In the rational, sane world, correct actions are met with rewards, and doing the wrong thing results in punishment. This is simple cause and effect, but unfortunately, this is

not the way the market works. Imagine a completely crazy teacher in a classroom, who without any rhyme or reason randomly screams at some students, ignores some, rewards a few, and punishes others. A student could hand in a perfect paper and get a failing grade, sometimes more than once, while a student who puts a big "X" in the middle of a single sheet of paper receives a perfect score for what was supposed to be a 25-page essay. It is not that the teacher is actively punishing the good students; there is no pattern at all to the teacher's actions. Can you imagine trying to learn in such an environment?

This is a problem for traders, because the market is like this teacher; it often rewards incorrect behaviors and punishes perfectly correct actions. You can do exactly the right thing on a trade and lose money several times in a row, or you can make a serious mistake and make a lot of money. The statistical edges in our trading setups become valid only over a large sample size; on any one trial, anything can happen. Especially for developing traders, this random reinforcement, coupled with the extreme emotional charge of both winning and losing, conspire to create one of the most challenging learning environments imaginable.

Random reinforcement is a profoundly powerful tool for behavior modification, and is frequently used to train animals. If you train dogs and reward them every time they obey, their good behavior will probably stop as soon as the rewards stop. On the other hand, if you randomly reward their obedience by sometimes giving a treat and sometimes not, the modifications to their behavior will usually be permanent. (Again, do you see any parallels with slot machines?) It may be counterintuitive, but random reinforcement is actually a much more powerful tool to shape behavior than consistent reinforcement.

There is so much random noise in the market that even excellent trading systems have a large random component in their results. Over a small set of trades, random reinforcement of both good and bad behavior is *normal* for our interactions with the market. Excellent decisions are just about as likely to be met with good results as bad results, and poor decisions will also result in a number of winning trades. Traders trying to be responsive to the feedback of the market and trying to learn from their interactions with the market are likely to be confused, frustrated, and eventually bewildered.

The market's reinforcement is not truly random; over a large number of trades, results do tend to trend toward the expected value, but it certainly can seem random to the struggling trader. The solution should not surprise you by now: evaluate your trading results over a large sample size, and use statistics to separate reality from your emotional perceptions. Learn from 20 or 30 trades, not one. Make decisions about changing your trading rules based on the results from 50 trades, not five. The market is a capricious teacher.

EMOTIONS: THE ENEMY WITHIN

As logical and rational as we try to be, there is no denying it: our decisions are made based on a combination of reason, intuition, and feeling, each in degrees depending on

our personal makeup and the specific situation. Once again, this is a mode of decision making that has great utility in many situations, but it can misfire in the context of trading and markets. Emotions can create stress that unbalances the brain on a chemical level. Emotions can cause us to overweight and underweight certain factors, and sometimes to make decisions without any reasoning at all. Successful traders have many strategies for dealing with their emotions, but that is the common thread—they have all found a way to integrate their emotions into their trading process. Some deny and control them with iron discipline and try to become logical machines, some seek modes of trading that remove emotion from the decision process, and some embrace their emotionality and actually build their trading process around it; but in all cases, they understand their emotional balance and how to control it within the framework of their work flow.

Ego

We all have egos. (I am using the term *ego* here in the colloquial sense to mean self-image rather than in any formal, psychoanalytical context.) Everyone likes to be right, likes to be seen as intelligent, and likes to be a winner. We all hate to lose, and we hate to be wrong; traders, as a group, tend to be more competitive than the average person. These personality traits are part of what allows a trader to face the market every day—a person without exceptional self-confidence would not be able to operate in the market environment. Like so many things, ego is both a strength and a weakness for traders. When it goes awry, things go badly wrong. Excessive ego can lead traders to the point where they are fighting the market, or where they hold a position at a significant loss because they are convinced the market is wrong. It is not possible to make consistent money fighting the market, so ego must be subjugated to the realities of the marketplace.

One of the big problems is that, for most traders, the need to be right is *at least* as strong as the drive to make money—many traders find that the pain of being wrong is greater than the pain of losing money. You often have minutes or seconds to evaluate a market and make a snap decision. You *know* you are making a decision without all the important information, so it would be logical if it were easy to let go of that decision once it was made. For nearly all traders, this is not the case because we become invested in the outcome once risk is involved. Avoiding emotional attachment to trading decisions is a key skill of competent trading, and being able to immediately and unemotionally exit a losing trade is a hallmark of a master trader.

Being wrong is an inescapable part of trading, and, until you reconcile this fact with your innate need to be right, your success will be limited. Earlier in this book, I suggested that an appropriate way to look at normal trading losses is not as losses at all, but simply as a planned, recurring cost of doing business. Though many traders feel shame, anger, and hurt over losing trades, this is illogical—the market is so random that it is absolutely impossible to trade without losing. Many good traders are wrong far more often than they are right; trading is not about being right or predicting the future. All you can do is

to identify places where you might have a small edge in the market, put on the trade, and open yourself to the possible outcomes.

Hope and Fear

Scylla and Charybdis were two sea monsters in Greek mythology situated in a narrow strait so that ships had to pass close to one or the other; captains had to choose because it was not possible for a ship to make the passage and to avoid both. For traders, fear and hope are the twin monsters, and no matter how experienced we may be as traders, we are unable to completely conquer them. What we can and must do, however, is to become aware of our weaknesses and our responses to these emotions. If we can monitor ourselves for susceptibility to errors, we can often intervene before the emotional reaction has resulted in a poor decision.

The reasons for fear are obvious. Most traders are afraid of loss, though this is probably rooted in a misunderstanding. It is wrong to be concerned about or to focus on the normal losses that accrue as part of the trading process, but there is certainly the danger of the unexpected and uncontrollable loss from an outlier event. Recent flash crashes have shown that stable markets can have unprecedented sell-offs; who would have thought that a big blue-chip stock could drop 80 percent in a few minutes? Many traders also face deeper, darker fears that are tied in to questions of self-worth, security, and personal finance. Even for a well-balanced person, trading can be a serious emotional challenge at times.

As powerful as fear is, many traders find that hope is actually more dangerous. Hope encourages us to take potentially reckless risks that we might not otherwise take. It can keep us in winning trades long after the profit potential is gone; many traders give back a lot of open profit because they are clawing for even more. Many traders are also loath to exit their losing trades, sometimes even at their predetermined stop level, because they are *hoping* that the trade will turn around and become a smaller loss. Once again, one of the distinguishing characteristics of successful traders is an ability to cut losers with minimal emotional attachment. No individual trader can succeed without mastering both hope and fear.

After many years and many mistakes fighting these twin monsters, I found a solution that works for me. It is deceptively simple, but it is difficult to do consistently. Here it is: *for every trade you put on, immediately assume you are wrong*. This is your baseline assumption, and, if you find evidence to the contrary (that you are right), be pleasantly surprised. This works because it takes all pressure off you and all hope out of the trade. Normally, once you have made a decision to buy a market, confirmation bias kicks in and you will start to subtly overweight information that supports your position. Instead, think, "I bought it thinking it will go up, but I'm probably wrong." There is no struggle, no fight against the reality of the market, and also no fear because you are *expecting* to be wrong. This is a subtle shift in your thinking, but it can produce a powerful change in your perspective and your behavior.